Stanford

Tiziana Vanorio

Associate Professor of Earth and Planetary Sciences, Senior Fellow at the Precourt Institute for Energy and, by courtesy, of Civil and Environmental Engineering

Earth & Planetary Sciences

Curriculum Vitae available Online

Bio

BIO

Tiziana Vanorio is an Associate Professor in the Earth and Planetary Sciences Department, School of Sustainability, where she leads the Rock Physics and Geomaterials Laboratory. Her research integrates laboratory experiments with analytical techniques to investigate the physical and mechanical properties of rocks and geomaterials. Exploring the influence of composite structures on properties across various scales, from microstructural features to bulk properties, is the focal point of her program. Her group applies this understanding to study new processes for engineering both the subsurface and materials, such as enhancing CO2 reuse through accelerated mineralization techniques, studying the main engine of naturally occurring hydrogen, and replicating natural cementation processes and fibrous nanostructures. These efforts are positioned to enhance resource efficiency as well as advancing towards an energy-efficient future and a more sustainable cement industry.

ACADEMIC APPOINTMENTS

- Associate Professor, Earth & Planetary Sciences
- Senior Fellow, Precourt Institute for Energy
- Associate Professor (By courtesy), Civil and Environmental Engineering

ADMINISTRATIVE APPOINTMENTS

- Associate Professor, Stanford University, (2020- present)
- Sr Associate Dean for Academic Affairs, Stanford University, (2020- present)
- Assistant Professor, Stanford University, (2013-2020)
- Invited Professor, Center for Carbonate System and Reservoir Geology, Université de Provence Aix Marseille, France, (2010-2010)
- Senior Research Scientist, Geophysics Department, Stanford University, (2008-2013)
- Research Associate, Geophysics Department, Stanford University, (2005-2008)
- Marie Curie Research Fellow, UMR Géosciences Azur,, Université de Nice Sophia Antipolis, France, (2002-2005)
- Post-doctoral Researcher, Geophysics Department, Stanford University, (1999-2001)

HONORS AND AWARDS

- Alfred Wegener Award, European Association of Geoscientists and Engineers (2018)
- Editor’s Choice “Printing Out The Pores”, SCIENCE (2016)
- Cover of the journal SCIENCE “Concrete Connection”, SCIENCE (2015)
- NSF CAREER Award, National Science Foundation (2015)

- Nominee to the Stanford "Great Teaching Showcase", Stanford's Year of Learning, Stanford University (2015)
- SPE Innovative Teaching Award, Society of Petroleum Engineering (2014)
- Editors' Citation for the Brightspots of Geophysics, Society of Exploration Geophysics (2011)
- Best Paper of SEG and E&P Forum, Society of Exploration Geophysics (2010)
- EURY program, ranked among the top 5 outstanding young researchers in France, European Science Foundation (2005)
- Marie Skłodowska-Curie Fellow, European Community, Marie Curie Individual Fellowship (2002-2005)
- NATO Fellowship, Italian National Research Council (2000)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, Faculty Search Committee, Stanford University (2015 - present)
- Invited Seminar Speaker (Dec), USGS Pacific Region Colloquium, Menlo Park, CA (2016 - 2016)
- Invited Seminar Speaker (Nov), San Jose State University Geology Club (2016 - 2016)
- Keynote Speaker (Sept), 88th Congress Italian Geological Society, Naples, Italy (2016 - 2016)
- Invited Speaker (July), SEG-AGU Summer Workshop, Upper Crust Physics of Rocks, Hilo, Hawaii (2016 - 2016)
- Invited Speaker (April), EGU General Assembly, Vienna, Austria (2016 - 2016)
- Invited Speaker (March), PGS - Peninsula Geological Society (2016 - 2016)
- Invited Seminar Speaker, USGS, Menlo Park, USA (2015 - 2015)
- Invited Seminar Speaker, University of Pisa, Italy (2015 - 2015)
- Invited Seminar Speaker, University Joseph Fourier, Grenoble (2015 - 2015)
- Member, Outreach Committee, Stanford University (2015 - present)
- Member, Undergraduate Committee, Stanford University (2015 - 2015)
- Member, Admission Committee, Stanford University (2015 - 2015)
- Invited Seminar Speaker, Georgia Tech (2014 - 2014)
- Invited Speaker, Evolving Rock Structure: From Grain-Scale to Planet-Scale, Gordon Research Conference (2014 - 2014)
- Member, Advisory PhD Committees, Stanford University (2013 - present)
- Member, Teaching Task Force Committee, Stanford University (2013 - present)
- Keynote speaker, Advanced Carbonate Reservoir Characterization, SPE Applied Technology Workshop (2013 - 2013)
- Symposium Chair, Measuring, Imaging, and Computing to Probe Multi-scale Rock Processes, AGU Fall Meeting (2013 - 2013)
- Invited Speaker, New Developments in Carbonate Rock Physics Characterization, AAPG Geosciences Technology Workshop (2012 - 2012)
- SEG D&P Summer Forum Committee, “Are We Ready for Megatonne-Scale CO2 Sequestration and EOR?”, SEG (2010 - 2010)
- Chair and Organizer, EAGE Workshop, “Carbonate Rock Physics: the Good, the Bad, and the Unknown”, EAGE (2009 - 2009)
- Member, Space Committee, School of Earth Sciences, Stanford University (2009 - 2009)
- Convener, AGU Session, “Monitoring Techniques and Interpretation Methods for Coupled Thermo-Hydro-Mechanical Processes in the Earth Crust”, AGU (2008 - 2008)
- Member, Scientific Program Review Panel, Agence National de la Recherche, France (2008 - 2008)
- Session Chair and Technical Committee Member, SEG Summer Research Workshop, “Emergent and Challenging Issues in Rock Physics: Rock This House!” Galway, SEG (2008 - 2008)
- Member, Committee for the Best Student Award, AGU Fall Meeting, San Francisco, AGU (2007 - present)
- Member, Scientific Program Review Panel, DOE - BES (2007 - present)
- Member, Lab Consolidation Committee, Stanford University (2007 - 2008)
- Judge, School of Earth Science Research Review, Oral Presentation, School of Earth Science, Stanford University (2007 - 2007)

- Member, Scientific Program Review Panel, European Community, Marie Curie Program (2005 - present)

LINKS

- Faculty Profile: https://earth.stanford.edu/people/tiziana-vanorio#gs.b1pemg
- Research Group Web Site: https://rgl.stanford.edu/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Research

I study the effect of rock-fluid interactions on rock properties. When monitoring many geophysical processes—for example, fluid disposal or storage, thermal and chemical stimulation of reservoirs, or naturally occurring thermo-chemical processes—the likelihood of fluid-rock chemical interactions raises numerous concerns. Unpredicted rock alteration can cause leaks leading to ground and surface contamination, can undermine the efficacy of certain stimulation practices, and can lower the rock strength exposing the area to seismic activity. To prevent unexpected outcomes in these situations, we must address an important scientific question: how to geophysically characterize, with more accuracy than is currently available, the effect of rock-fluid interactions on rock properties?

My research focuses on deciphering the geophysical response of rock-fluid interactions. My group and I are using a sophisticated experimental approach that includes multi-physics, multi-scale imaging, and time-dependence to understand the effects on the observed geophysical parameters of the wide spectrum of changes that a rock experiences as a result of coupled thermo-chemo-mechanical processes.

Practical applications of my research include the geophysical characterization of the chemical and physical changes that a rock formation experiences upon the injection of fluids for the purpose of storage (i.e., CO2) and enhancement of the production of fossil energy (i.e., unconventional reservoirs and formation damage).

Teaching

My undergraduate teaching focuses on introducing students to the topic of energy and the challenges surrounding it so they can get prepared to become environmentally aware members of society. As part of this objective, I developed a new course, The Water-Energy Nexus. Students learn about the basic concepts of the conjoined management of the water and energy resources and gain a practical knowledge of how research is done. Under the instructor's guidance, the students choose a question of interest for a short, literature-based research project related to the course theme. At the graduate level, I offer classes and seminars on experimental rock physics (GP162- Laboratory Methods In Geophysics). The class combines theoretical lectures and hands-on demonstrations of laboratory procedures. Students learn the underpinning knowledge for experimental rock physics and develop laboratory skills –e.g., making deductions from measurements, familiarizing with apparatus and measurement techniques, acquiring critical awareness, bridging theory and practice.

To adapt knowledge and skills to the high-tech student’s lifestyle and inspire and engage the next generation of experimental scientists, I am leading a project that is designed to complement lectures on laboratory techniques and analytical methods with an online repository of visualized experiments. The repository is composed of interactive, 3-D animated renderings that show how to assemble and operate laboratory set-ups for conducting experiments, and measure rock properties that are central to the characterization of the Earth sub-surface.
The tools provide a virtual laboratory to facilitate teaching of introductory laboratory classes and expose students from other institutions to techniques that might be unavailable to them due to the lack of a rock-physics laboratory in their Geosciences. facilities.

PROJECTS

- Experimental Investigation For the Characterization of the Geophysical Response of Rock-Fluid Interactions (1/15/2015 - 12/31/2019)
- Evolution of the Elastic and Transport Properties of Barnett Shales Upon Natural and Induced Maturation
- A Repository of Visualized and Interactive Experiments in Geophysics - VPOL Seed Grant & SES Support
- Shale Rock Properties for Sweet Spot Identification: Measuring, Imaging, and Computing
- Advanced Technologies for Monitoring CO2 Saturation and Pore Pressure in Geologic Formations: linking the Chemical and Physical Effects to Elastic and Transport Properties.
- Linking Chemical and Physical Effects of CO2 injection to Geophysical Parameters

Teaching

COURSES

2026-27

- Experimental Rock Physics: EPS 384 (Aut)
- Laboratory Characterization of Properties of Rocks and Geomaterials: EPS 230 (Spr)
- Rocks to Riches: How Earth Materials Shape Sustainable Technology: EPS 40N (Win)

2025-26

- Laboratory Characterization of Properties of Rocks and Geomaterials: EPS 230 (Spr)

2024-25

- Experimental Rock Physics: EPS 384 (Win, Spr)
- Laboratory Characterization of Properties of Rocks and Geomaterials: CEE 192, EPS 230, GEOPHYS 162, GEOPHYS 259 (Spr)

2023-24

- Experimental Rock Physics: EPS 384, GEOPHYS 385N (Aut, Win, Spr)
- Laboratory Characterization of Properties of Rocks and Geomaterials: CEE 192, EPS 230, GEOPHYS 162, GEOPHYS 259 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Dolly Mantle

Orals Chair

Henry Moise

Postdoctoral Faculty Sponsor

Tianyang Guo, Chengyao Liang

Doctoral (Program)

Jacob Long

Publications

PUBLICATIONS

- **The recurrence of geophysical manifestations at the Campi Flegrei caldera.** *Science advances*
  Vanorio, T., Geremia, D., De Landro, G., Guo, T.
  2025; 11 (18): eadt2067

- **Using acoustic velocities and microimaging to probe microstructural changes caused by thermal shocking of tight rocks** *FRONTIERS IN EARTH SCIENCE*
  Malenda, M., Vanorio, T.
  2023; 10
- **Hydrothermal formation of fibrous mineral structures: The role on strength and mode of failure** *FRONTIERS IN EARTH SCIENCE*
  Vanorio, T., Chung, J., Siman-Tov, S., Nur, A.
  2023; 10
- **The effects of CO2-rock interaction on the failure mode of clay-rich sandstone** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*
  Guo, T., Vanorio, T.
  2026; 155
- **A Deep-Learning P-Wave Arrival Picker for Laboratory Acoustic Emissions: Model Training and Its Performance** *ROCK MECHANICS AND ROCK ENGINEERING*
  Guo, T., Vanorio, T., Ding, J.
  2024
- **Integrating laboratory acoustic measurements, deep neural networks, and micro-CT imaging for characterizing rock brittle deformation** *FRONTIERS IN EARTH SCIENCE*
  Ding, J., Clark, A. C., Vanorio, T.
  2023; 11
- **Using acoustic velocities and microimaging to probe microstructural changes caused by thermal shocking of tight rocks (vol 10, 1054469, 2023)** *FRONTIERS IN EARTH SCIENCE*
  Malenda, M., Vanorio, T.
  2023; 11
- **Elastic anisotropy of shales: The roles of crack alignment and compliance ratio** *GEOPHYSICS*
  Ding, J., Clark, A. C., Vanorio, T., Jew, A. D., Bargar, J. R.
  2022; 87 (2): A13-A17
- **Acoustic velocity and permeability of acidized and propped fractures in shale** *GEOPHYSICS*
  Ding, J., Clark, A. C., Vanorio, T., Jew, A. D., Bargar, J. R.
  2022; 87 (1): MR13-MR24
- **Multi-scale imaging, strength and permeability measurements: Understanding the durability of Roman marine concrete** *CONSTRUCTION AND BUILDING MATERIALS*
  MacFarlane, J., Vanorio, T., Monteiro, P. J. M.
  2021; 272
- **Monitoring chemo-mechanical deformation through acoustic emission experiments** *SEG Technical Program Expanded Abstracts*
  Mighani, S., et al
  2020
- **Time-Lapse Acoustic Monitoring of Facture Alteration in Marcellus Shale** *Unconventional Resources Technology Conference*
  Ding, J., et al
  2020
- **Petrophysical Changes In Cemented-Ash Formations Due To Calcium Rich Fluid-Rock Interactions: An Experimental Study.** *AGU Fall Meeting*
  MacFarlane, J., et al
  2020
- **The Rock Physics of Fibrous Rocks: Chemo-Mechanical Interactions Controlling Rheological Properties** *AGU20 Fall Meeting*
  Vanorio, T., et al
  2020
- **Data-driven elastic modeling of organic-rich marl during maturation** *GEOPHYSICS*
  Suwannasri, K., Vanorio, T., Clark, A. C.

2020; 85 (1): MR11–MR23

- **Acoustic velocity signatures of acidized and propped fractures in Marcellus Shale** *SEG Technical Program Expanded Abstract*
  Ding, J., et al
  2020
- **Monitoring Chemo-Mechanical Fracture Behavior through Engineering Geophysics Experiments** *82nd EAGE Annual Conference & Exhibition Workshop Programme*
  Ding, J., et al
  2020
- **Dynamic Evolution of Permeability in Response to Chemo-Mechanical Compaction** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Macente, A., Vanorio, T., Miller, K. J., Fusseis, F., Butler, I. B.
  2019; 124 (11): 11204–17
- **Predicting porosity of binary mixtures made out of irregular nonspherical particles: Application to natural sediments** *ADVANCED POWDER TECHNOLOGY*
  El-Husseiny, A., Vanorio, T., Mavko, G.
  2019; 30 (8): 1558–66
- **A scale-consistent method for imaging porosity and micrite in dual-porosity carbonate rocks** *GEOPHYSICS*
  Miller, K., Vanorio, T., Yang, S., Xiao, X.
  2019; 84 (3): MR115–MR127
- **Monitoring The Changes In The Microstructure, Elastic And Transport Properties of Eagle Ford Marl Caused By Ex-Situ Maturation** *GEOPHYSICS*
  Suwannasri , K., Vanorio , T., Clark , A.
  2018; 83 (5): MR263-MR281
- **KG²B, a collaborative benchmarking exercise for estimating the permeability of the Grimsel granodiorite – Part 2: modeling, microstructures and complementary data** *GEOPHYS. J. IINT.*
  David, C., Wasserman, J., Amann, F., Klaver, J., Davy, C., Sarout, J., Esteban, L., Rutter, E., Hu, Q., Louis, L., Delage, P., Lockner, D., Selvadurai, et al
  2018; 214 (1)
- **KG²B, a collaborative benchmarking exercise for estimating the permeability of the Grimsel granodiorite – Part 1: measurements, pressure dependence and pore-fluid effects** *GEOPHYS. J. IINT.*
  David, C., Wassermann, J., Amman, F., Lockner , D., Rutter, E., Vanorio, T., Amann Hildenbrand , A., Billiotte , J., Reuschlé , T., Lasseux , D., Fortin, J., Lenormand, R., et al
  2018; 214 (1)
- **Imaging of local porosity and micrite distributions of carbonate rocks using data-constrained modeling** *GEOPHYSICS*
  Miller, K., Vanorio, T., Yang, S., Xiao, X.
  2018
- **Permeability of volcanic ash-lime mixtures during CO2-mediated Carbonation and Decompression** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Clark, A., MacFarlane, J., Vanorio, T.
  2018; 123
- **Elastic Softening of Limestone upon Decarbonation with Episodic CO2 Release** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Head, D., Vanorio, T., Clark, A.
  2018; 123: 7404–7420
- **Evolution of permeability and microstructure of tight carbonates due to numerical simulation of calcite dissolution** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Miller, K., Vanorio, T., Keehm, Y.
  2017; 122 (6): 4460-4474
- **Evolution of Permeability due to Rock-Fluid Interaction: Numerically Simulated and Experimentally Measured Dissolution** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*

Miller, K., Vanorio, T., Keem, Y.
2017

- **The KG(2)B Project: A World-Wide Benchmark of Low Permeability Measurement**
David, C., Wassermann, J., KG2B Team
edited by Vandamme, M., Dangla, P., Pereira, J. M., Ghabezloo, S.
AMER SOC CIVIL ENGINEERS.2017: 1153–61

- **Porosity-permeability relationship in dual-porosity carbonate analogs** *GEOPHYSICS*
El Husseiny, A., Vanorio, T.
2017; 82 (1): MR65-MR74

- **Can Rock Microstructures Exhibit An Auxetic Behavior?** *International Journal of Solids and Structures,*
Wollner, U., Vanorio, T., Kiss, A.
2017; 130-131: 211-219

- **Effects of changes in rock microstructures on permeability: 3-D printing investigation** *GEOPHYSICAL RESEARCH LETTERS*
Head, D., Vanorio, T.
2016; 43 (14): 7494-7502

- **On the evolution of the elastic properties of organic-rich shale upon pyrolysis-induced thermal maturation** *GEOPHYSICS*
Allan, A. M., Clark, A. C., Vanorio, T., Kanitpanyacharoen, W., Wenk, H.
2016; 81 (3): D263-D281

- **The rock physics and geochemistry of carbonates exposed to reactive brines** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
Clark, A. C., Vanorio, T.
2016; 121 (3): 1497-1513

- **Porosity-Permeability Relationship in Dual Porosity Carbonate Analogs** *GEOPHYSICS*
El Husseiny, A., Vanorio, T.
2016

- **Elastic and Transport Properties of Steam-Cured Pozzolanic-Lime Rock Composites Upon CO2 Injection (Invited)** *European Geosciences Union General Assembly, Vienna, Austria*
Emery, D., et al
2016

- **Fiber-Reinforced Rocks Akin to Roman Concrete Help Explain Ground Deformation at Campi Flegrei Caldera** *European Geosciences Union General Assembly, Vienna, Austria (Invited)*
Vanorio, T.
2016

- **Evolution of Porosity permeability Trends Due to Experiments-driven simulation of Calcite Dissolution in Tight Carbonate Rocks** *SEG/AGU Summer Workshop, Hilo, Hawaii*
Miller, K.
2016

- **Rock Fluid Interactions Under Stress: How Rock Microstructure Controls The Evolution of Porosity and Permeability** *American Geophysical Union, Fall Meeting, abstract #H13F-1446*
Vanorio, T.
2016

- **From Large Rock Strain in Volcanic Regions to High-performance Concrete** *SEG/AGU Summer Workshop, Hilo, Hawaii (Invited)*
Vanorio, T.
2016

- **, 3-D Printing as a Tool to Investigate the Effects of Changes in Rock Microstructures on Permeability** *American Geophysical Union, Fall Meeting 2016, abstract #MR41A-2682*
Head, D. A.
2016

- **The effect of geothermal fluid composition in lime-pozzolan reactions on elastic and transport properties** *American Geophysical Union, Fall Meeting 2016, abstract #MR51B-2709*
  MacFarlane, J. S.
  2016
- **Multi-scale image segmentation and numerical modeling in carbonate rocks** *American Geophysical Union, Fall Meeting 2016, abstract #MR13A-2378*
  Alves, G. C.
  2016
- **Evolution of permeability and microstructure of tight carbonates due to numerical simulation of calcite dissolution** *American Geophysical Union, Fall Meeting 2016, abstract #H13F-1441*
  Miller, K., et al
  2016
- **The Effect of Confining Pressure on the Velocity and Microstructure of Organic–rich ShaleDuirng the Thermal Maturation** *SEG/AGU Summer Workshop, Hilo, Hawaii*
  Suwannasri, K.
  2016
- **Effects of changes in rock microstructures on permeability: 3-D printing investigation** *Geophysical Research Letters. Selected as Editor's Choice by the journal Science*
  Head, D., Vanorio, T.
  2016: 1-9
- **On the Evolution of the Elastic Properties of Organic-Rich Shale upon Pyrolysis-Induced Thermal Maturation** *GEOPHYSICS*
  Allan, A., Clark, A., Vanorio, T., Kanitpanyacharoen, J., Wenk, R.
  2016; 81 (3): D263 – D281
- **The rock physics and geochemistry of carbonates exposed to reactive brines** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Clark, A., Vanorio, T.
  2016; 121 (3)
- **Time-lapse characterization of hydrothermal seawater and microbial interactions with basaltic tephra at Surtsey Volcano** *SCIENTIFIC DRILLING*
  Jackson, M. D., Gudmundsson, M. T., Bach, W., Cappelletti, P., Coleman, N. J., Ivarsson, M., Jonasson, K., Jorgensen, S. L., Marteinsson, V., McPhie, J., Moore, J. G., Nielson, D., Rhodes, et al
  2015; 20: 51–58
- **Chemomechanical evolution of pore space in carbonate microstructures upon dissolution: Linking pore geometry to bulk elasticity** *JOURNAL OF GEOPHYSICAL RESEARCH-SOLID EARTH*
  Arson, C., Vanorio, T.
  2015; 120 (10): 6878-6894
- **ROCK PHYSICS Rock physics of fibrous rocks akin to Roman concrete explains uplifts at Campi Flegrei Caldera** *SCIENCE*
  Vanorio, T., Kanitpanyacharoen, W.
  2015; 349 (6248): 617-621
- **The effect of micrite content on the acoustic velocity of carbonate rocks** *GEOPHYSICS*
  El Husseiny, A., Vanorio, T.
  2015; 80 (4): L45-L55
- **A multiscale methodology for the analysis of velocity anisotropy in organic-rich shale** *GEOPHYSICS*
  Allan, A. M., Kanitpanyacharoen, W., Vanorio, T.
  2015; 80 (4): C73-C88
- **Recent advances in time-lapse, laboratory rock physics for the characterization and monitoring of fluid-rock interactions** *GEOPHYSICS*
  Vanorio, T.
  2015; 80 (2): WA49-WA59

- **What Laboratory-Induced Dissolution Tell us About Natural Diagenetic Trends of Carbonate Rocks** *in Agar, S. M. & Geiger, S. (eds), Fundamental Controls on Fluid Flow in Carbonates. GEOLOGICAL SOCIETY OF LONDON, Special Publications*
  Vanorio, T., Ebert, Y., Grombacher, D.
  2015; 406 (v.4): 311-329
- **3D Printing Carbonate Microstructures: Preliminary Porosity-Permeability Trends with Applications to the Decarbonation Reaction** *AGU Fall Meeting*
  Head, D., et al
  2015
- **Pyrolysis-Induced Evolution of the Elastic and Transport Properties of the Barnett Shale** *85th SEG Technical Program Expanded Abstracts*
  Allan, A., et al
  2015
- **Pyrolysis-induced P-wave velocity anisotropy in organic-rich shales** *GEOPHYSICS*
  Allan, A. M., Vanorio, T., Dahl, J. E.
  2014; 79 (2): D41-D53
- **Velocity anisotropy variation in organic-rich shale as a function of confining pressure** *84th SEG Technical Program Expanded Abstracts*
  Allan, A.
  2014
- **A Virtual Rock Physics Laboratory Through Visualized and Interactive Experiments** *AGU Fall Meeting*
  Vanorio, T.
  2014
- **Experimental Diagenesis and 3D Printing of Evolving Carbonate Microstructures** *AGU Fall Meeting*
  Vanorio, T.
  2014
- **Pressure effects caused by CO2 injection in the Snøhvit Field** *First Break*
  Grude, S., Dvorkin, J., Vanorio, T., Clark, A., Landro, M.
  2013; 31 (12)
- **Time-lapse acoustic, transport, and NMR measurements to characterize microstructural changes of carbonate rocks during injection of CO2-rich water** *GEOPHYSICS*
  Grombacher, D., Vanorio, T., Ebert, Y.
  2012; 77 (3): WA169-WA179
- **The Campi Flegrei Blind Test: evaluating the imaging capability of local earthquake tomography in a volcanic area** *International Journal of Geophysics*
  Priolo, E., et al
  2012: 1-37
- **The Campi Flegrei Blind Test: Evaluating the Imaging Capability of Local Earthquake Tomography in a Volcanic Area** *International Journal of Geophysics*
  Priolo, E., et al
  2012
- **Laboratory measurements of the acoustic and transport properties of carbonate rocks and their link with the amount of microcrystalline matrix** *GEOPHYSICS*
  Vanorio, T., Mavko, G.
  2011; 76 (4): E105-E115
- **Modeling of elasticity effects of sandstone compaction using coated inclusions** *GEOPHYSICS*
  Agersborg, R., Johansen, T. A., Mavko, G., Vanorio, T.
  2011; 76 (3): E69-E79
- **Laboratory measurements of elastic properties of carbonate rocks during injection of reactive CO2-saturated water** *GEOPHYSICAL RESEARCH LETTERS*
  Vialle, S., Vanorio, T.

2011; 38

- **Rock Physics Analysis and Time-Lapse Imaging of Geochemical effects Due to the Injection of CO2 into Reservoir Rocks** *Geophysics and Highlighted in the Brightspots of Geophysics*
  Vanorio, T., Ebert, Y., Nur, A.
  2011; 76: 23-33
- **Laboratory measurements of porosity, permeability, resistivity, and velocity on Fontainebleau sandstones** *GEOPHYSICS*
  Gomez, C. T., Dvorkin, J., Vanorio, T.
  2010; 75 (6): E191-E204
- **Texture analysis of a turbostratically disordered Ca-montmorillonite** *AMERICAN MINERALOGIST*
  Lutterotti, L., Voltolini, M., Wenk, H., Bandyopadhyay, K., Vanorio, T.
  2010; 95 (1): 98-103
- **Measuring and Monitoring Heavy-Oil Reservoir Properties** *Heavy Oils: Reservoir Characterization and Production Monitoring*
  Wolf, K., et al
  Society of Exploration Geophysicists.2010
- **The Rock Physics Basis for 4D Seismic Monitoring of CO2 Fate: Are we there Yet?** *The Leading Edge*
  Vanorio, T., Mavko, G., Vialle, S., Spratt, K.
  2010; 29 (2)
- **Measuring and monitoring heavy-oil reservoir properties** *Geophysical Developments Series*
  Wolf, K., Vanorio, T., Mavko, G.
  2010; 27: 99-105
- **The influence of pore fluids and frequency on apparent effective stress behavior of seismic velocities** *GEOPHYSICS*
  Mavko, G., Vanorio, T.
  2010; 75 (1): N1-N7
- **Seismic images and rock properties of the very shallow structure of Campi Flegrei caldera (southern Italy)** *BULLETIN OF VOLCANOLOGY*
  Dello Iacono, D., Zollo, A., Vassallo, M., Vanorio, T., Judenherc, S.
  2009; 71 (3): 275-284
- **Confocal laser scanning and atomic-force microscopy in estimation of elastic properties of the organic-rich Bazhenov Formation Read More: https://library.seg.org/doi/10.1190/1.3064141** *The Leading Edge*
  Ahmadov, R., Vanorio, T., Mavko, G.
  2009; 28 (1)
- **Three-dimensional tomography and rock properties of the Larderello-Travale geothermal area, Italy** *PHYSICS OF THE EARTH AND PLANETARY INTERIORS*
  De Matteis, R., Vanorio, T., Zollo, A., Ciuffi, S., Fiordelisi, A., Spinelli, E.
  2008; 168 (1-2): 37-48
- **Emerging methodologies to characterize the rock physics properties of organic-rich shales** *The Leading Edge*
  Vanorio, T., Mukerji, T., Mavko, G.
  2008; 27 (6): 780-787
- **Measuring and monitoring heavy-oil reservoir properties** *The Leading Edge*
  Wolf, K., et al
  2008; 27 (9)
- **The Effect of Chemical Processes and Mineral Composition on the Acoustic Properties of Carbonate Rocks** *The Leading Edge*
  Vanorio, T., Scotellaro, C., Mavko, G.
  2008; 27 (8)
- **Campi Flegrei seismic waveforms compilation** *Geophysical Exploration of the Campi Flegrei Caldera's Interiors*
  Capuano, P., et al
  GNV.2006

- **Three dimensional QP and QS tomographic images of the Campi Flegrei caldera** *Geophysical Exploration of the Campi Flegrei Caldera's Interiors*
  De Lorenzo, S., et al
  2006
- **Thermo-mechanical modeling of the Campi Flegrei volcanic area** *Geophysical Exploration of the Campi Flegrei Caldera's Interiors*
  Giberti, G., et al
  2006
- **Joint 3D Seismo-Gravity Inversion (theoretical development)** *Geophysical Exploration of the Campi Flegrei Caldera's Interiors*
  De Franco, R., et al
  2006
- **The Campi Flegrei Blind Test: Tomographic inversion** *Geophysical Exploration of the Campi Flegrei Caldera's Interiors*
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